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Basic Imagery Interpretation Report

NATIONAL
PHOTOGRAPHIC
INTERPRETATION
CENTER

[redacted]

25X1

TA TUNG RADCOM STATION
(TA TUNG VLF COMMUNICATIONS FACILITY)

[redacted]

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DEPLOYED COMMO/ELEC/RADAR FACILITIES

CHINA

MARCH 1969

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INSTALLATION OR ACTIVITY NAME	COUNTRY
Ta Tung Radcom Station (Ta Tung VLF Communications Facility)	CH

UTM COORDINATES	GEOGRAPHIC COORDINATES
25X1 49SFQ251919	39-57-13N 113-14-59E [redacted] 25X1

MAP REFERENCE
25X1 ACIC. USATC, Series 200, Sheet M0382-4HL, 2d ed, Aug 67, scale 1:200,000 (SECRET, [redacted] 25X1
[redacted]

LATEST IMAGERY USED	NEGATION DATE (If required)
[redacted]	NA

ABSTRACT

The Ta Tung Radcom Station (Ta Tung VLF Communications Facility), 8 nm south of Ta Tung, China, contains a rectangular VLF antenna array which is apparently of Soviet design. The array is composed of five sections of horizontal curtains suspended on masts, forming a large capacitive flat top. A microwave facility and a support area for the VLF array are collocated within the fence-secured facility.

The VLF array is capable of providing communications with surface ships and submarines, long distance telegraph communications, and radio navigation. The Ta Tung installation is the only high-power VLF facility in China identifiable on photography.

INTRODUCTION

The Tatung VLF (very low frequency) Communications Facility is approximately 8 nautical miles south of Tatung, China at 39-57-13N 113-14-59E (Figure 1). The site is at an elevation of 3,500 feet above sea level, and the antenna is situated on flat, 25X1 semimarshy terrain and vegetation presents no obstacles to VLF radio propagation. No related installations in the immediate vicinity of the facility are identifiable on available photography.

[redacted]

Large-scale photographic coverage of the Tatung area is required for the refinement of analysis of the Tatung VLF Communications Facility; confirmation of the reported existence of a microwave link; and identification of the naval HF communications facility.

VLF facilities require a high-power source, but no power transmission lines can be identified on available photography of the Tatung area.

BASIC DESCRIPTION

Physical Features

The physical and electrical parameters of the Tatung VLF Communications Facility are comparable to the Khabarovsk VLF Communications Facility [redacted] 25X1 in the USSR. Because of the similarities, it seems likely that the Chinese received Soviet support in designing the Tatung facility. Soviet design characteristics combined with analysis 25X1 of the Khabarovsk facility as seen on [redacted] photography comprise the primary basis for this analysis of the Tatung facility.

The Tatung VLF antenna array consists of five sections of horizontal curtains, contiguous to each other, but physically and electrically separate. The curtains are suspended 25X1 on 18 masts, each 24 meters high [redacted]. Each of the three center curtain sections measures 622 by 500 meters; the northern end section measures 622 by 556 meters, and the southern end section measures 622 by 541 meters for an overall dimension of 2,597 25X1 by 622 meters [redacted]. These five sections of horizontal curtains form the capacitive flattop section of the VLF array. One of the horizontal curtain sections of the flattop is shown on Figure 2.

The curtains are insulated from the supporting masts by chains of insulators with equalizing rings. The conductors, which can number up to 20 per curtain, are supported by a catenary cable at each end and in the center. 1/ The small scale of the photography available for this analysis precludes identification of the number of conductors in each curtain.

Of the 18 masts, the 14 periphery masts are straight guyed masts, and the four in the center are A-frame guyed masts. All appear to be grounded. No base insulator is discernible nor do the guy wires have insulators installed along their length. This procedure increases the operating reliability of the antenna system performance and reduces the outlay for the construction. A winch house is situated in the center of each A-frame mast and adjacent to the base of each straight guyed mast.

A large earth-covered helix house is in the center of the array (Figure 2). A smaller earth-covered house containing a tuning inductor is in the center of each horizontal curtain. Two parallel rows of towers are along the entire center chord of the array. One row of towers is in line with the center of the helix house and the tuning inductor houses. Each tower is approximately 18 meters high [redacted] The 25X1
parallel row of towers are contiguous to the western edge of the service road and in line with the row of towers passing through the helix house and the tuning inductor houses. Limited interpretability of the available photography precludes mensuration of the height of the towers in this row and of the distance between the rows of towers.

A downlead is attached to the center of each horizontal curtain and is brought down to the helix house and tuning inductor houses directly below. The two parallel rows of towers provide support for the downleads and also comprise a parallel tuning network for the array. The small scale of the photography precludes determination of the actual feed point of the array. In practice, the transmitter feeds one downlead, and each remaining downlead is tuned by its respective inductor. 2/

The ground system of the array underlies the entire flattop area. The ground conductors are wires buried at a depth of 20 to 40 centimeters. The entire area of the ground system consists of a network of trenches in which a constant level of water is maintained. This procedure reduces the magnitude of the ground resistance and keeps it constant with the seasonal variation of ground conductivity. A part of the ground system is sketched on Figure 2.

Support Facilities

A microwave tower is on an earth mound in the southeast corner of the facility. The height of the tower is 120 feet, and that of the earth mound is [redacted] for an overall 25X1
25X1 height of [redacted] above ground level (± 10 feet). The antenna is oriented on an azimuth

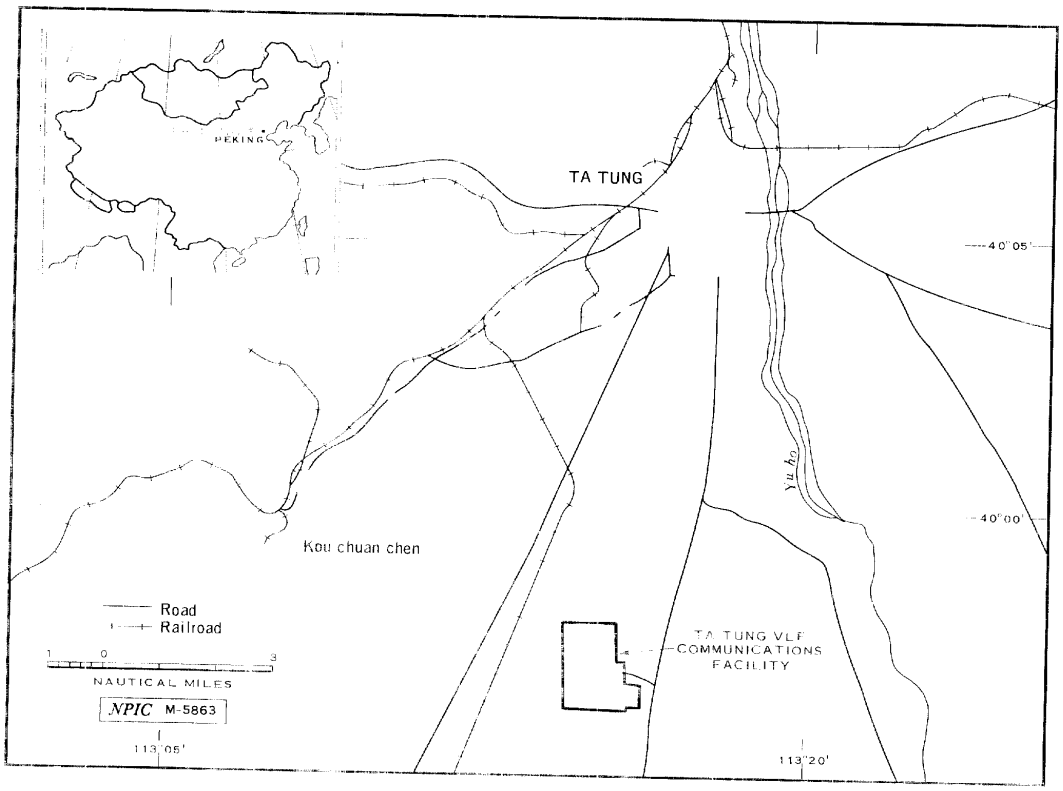
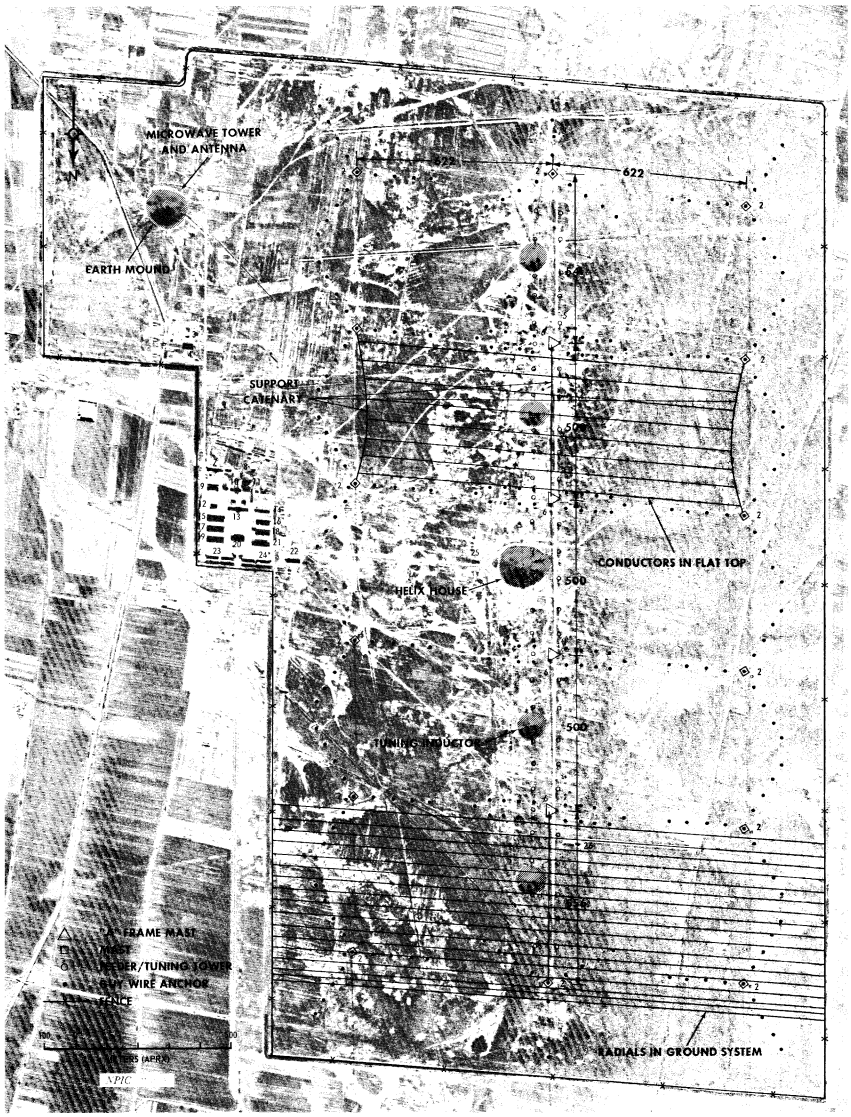


FIGURE 1. LOCATION MAP.



25X1 *FIGURE 2. TATUNG VLF COMMUNICATIONS FACILITY, CHINA.* [redacted]

Table 1. Descriptions and Dimensions of Structures at the Tatung VLF Communications Facility.

(Item numbers are keyed to Figure 2)

Item	Description	Dimensions* (feet)
1	Building	[redacted]
2	Winch houses (14)	
3	Building	
4	Building	
5	Building	
6	Winch houses (4)	
7	Building	
8	Building	
9	Poss admin bldg	
10	Poss power plant	
11	Building	
12	Building	
13	Poss transmitter/control bldg	
14	Building	
15	Building	
16	Building	
17	Building	
18	Building	
19	Building	
20	Building	
21	Building	
22	Building	
23	Poss barracks (7)	
24	Poss barracks	
25	Building	
26	Building	

*All dimensions are approximate.

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of 055 degrees (± 5 degrees). The size of the antenna cannot be determined on available photography. Cable scars lead from the base of the mound to the station's support area and to the broadcast towers.

The support area is on the eastern side of the facility within the security fence (Figure 2). Buildings in the support area as well as other buildings throughout the VLF facility are listed in Table 1 which is keyed to Figure 2. This table provides dimensions of the buildings and functional information on the buildings in cases where the functions can be determined. 25X1

[redacted]

Status and Activity

The Tatung VLF Communications Facility was first identified on overhead photography as a VLF antenna in [redacted] provided the first large-scale photography of the facility, and at that time the facility was reported as being complete. [redacted] provided the latest large-scale photography of the facility. No apparent change has been observed in the facility from [redacted] 25X1 25X1 25X1 25X1 25X1

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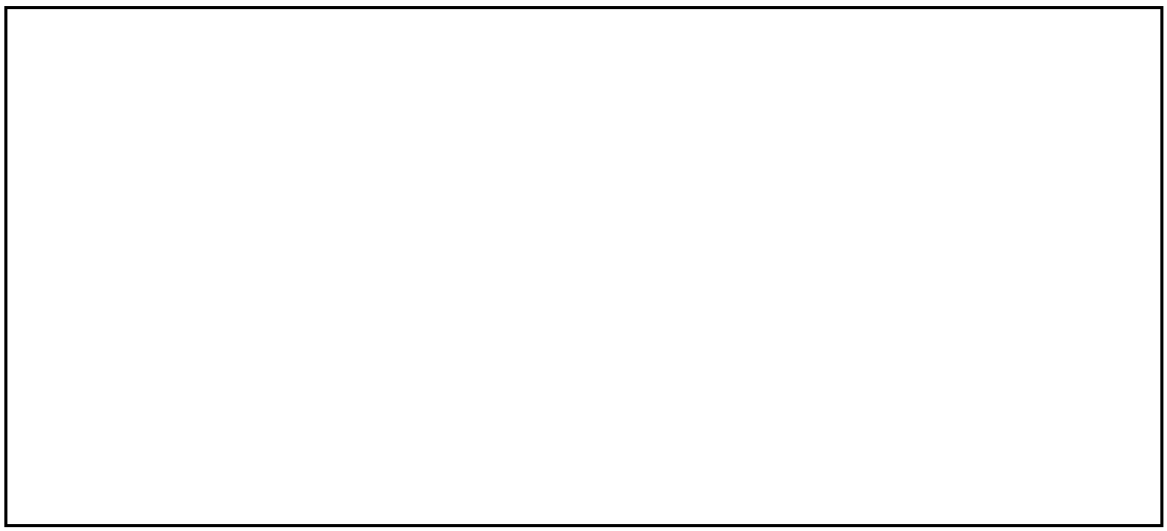
REFERENCES

IMAGERY



MAPS OR CHARTS

ACIC. USATC, Series 200, Sheet M0382-4HL, 2d ed, Aug 67, scale 1:200,000 (SECRET/

DOCUMENTS

1. Antenna Devices -- USSR, G.A. Savitskiy (UNCLASSIFIED)
2. Design and Methods of Calculating Parameters of Long Wave and Ultra-Longwave Antennas, USSR, US Department of Commerce, TT: 67-32823 NPIC/Ref (UNCLASSIFIED)
3. DIA. LF and VLF Communications (Technical Characteristics, Capabilities, and Trends) -- Eurasian Communist Countries, STIC-CS-05-5-68-INT (SECRET)

REQUIREMENTS

COMIREX BR-C/003-69

NPIC Project 210626